

## DISTORTION COMPENSATION IN AN ACOUSTIC ECHO CANCELER

### ABSTRACT OF THE DISCLOSURE

An audio communications system has an acoustic echo cancellation (AEC) module. The AEC module receives a digital signal sent to a loudspeaker and a digital signal received from a microphone. The signal received from the microphone contains an echo of the signal played through the loudspeaker. The loudspeaker signal is processed by an audio generation module (AGM) that models substantially nonlinear distortions that can occur while producing the signal played through the loudspeaker. The AGM includes a modeling path comprised of one or more distortion modules. Each distortion module receives digital samples as input, modifies the samples to model a form of distortion, and outputs the modified samples. The output of the AGM is provided to an acoustic echo estimation (AEE) module that uses adaptive algorithms to compensate for substantially linear changes in the echo characteristics of the environment in which the loudspeaker and microphone are located. The output of the AEE module is provided to an audio sensing module (ASM) that models substantially nonlinear distortions that can occur while receiving the signal from the microphone. The digital samples returned from the microphone, and the output of the ASM, are received by an adder module. The adder module subtracts the estimated echo from the samples returned from the microphone, thereby removing at least part of the estimated echo from the microphone signal.